MONOGRAPH

Ceftazidime Monograph - Paediatric

Scope (Staff):	Medical, Pharmacy, Nursing
Scope (Area):	All Clinical Areas

Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this DISCLAIMER

QUICKLINKS

Dosage/Dosage Adjustments	Administration	Compatibility	Monitoring

DRUG CLASS

Broad spectrum cephalosporin.[1-4]

INDICATIONS AND RESTRICTIONS

- Ceftazidime is a third-generation cephalosporin antibiotic with broad, Gram-negative (including antipseudomonal) activity. It is generally reserved for the treatment of *Pseudomonas aeruginosa* infections (particularly in patients with Cystic Fibrosis).[2-4]
- It is also available as a combination formulation ceftazidime with avibactam (see separate monograph), designed to overcome specific resistance mechanisms (e.g. some carbapenemases).

IV: Monitored (orange) antibiotic

Ceftazidime is indicated for use as per the indications stipulated in Formulary One. For any other use, phone approval must be obtained from ChAMP before prescribing as per the Children's Antimicrobial Management Program (ChAMP) Policy.

CONTRAINDICATIONS

- Hypersensitivity to ceftazidime or any component of the formulation or history of high-risk allergy to cephalosporins.[1, 2, 4-8]
- Hypersensitivity to aztreonam, as cross-reactivity may occur.[1, 2]

PRECAUTIONS

- Ceftazidime may be prescribed in selected patients with high-risk allergy to another beta-lactam sub-class (e.g. some penicillins, carbapenems) in discussion with immunology.[2]
- In patients with a previous low risk reaction to ceftazidime or another cephalosporin (delayed rash [>1hr after initial exposure] without mucosal or systemic involvement) the risk of subsequent reaction is low. Re-challenge may be acceptable in discussion with immunology.
- Each 1 gram of ceftazidime contains 2.3 mmol (52 mg) of sodium.[1, 2, 5, 8]
- Carbon dioxide is released during reconstitution, ensure bubbles have cleared and air removed prior to administration.[1, 2, 7]

FORMULATIONS

Listed below are products available at PCH, other formulations may be available, check with pharmacy if required:

- 1 gram powder for injection vial
- 2 grams powder for injection vial

Also available as a combination product: refer to the Ceftazidime with avibactam Monograph - Paediatric

Imprest location: Formulary One

DOSAGE & DOSAGE ADJUSTMENTS

Neonates: Refer to Neonatal Medication Protocols

Children (>4 weeks to 18 years):

IV:

- **Severe infections:** 50 mg/kg/dose (to a maximum of 2 grams) 8 hourly.[2, 9]
- **Cystic fibrosis:** 50 mg/kg/dose (to a maximum of 3 grams) 8 hourly.[2, 4, 7-9]

Dosing in Overweight and Obese Children: Dose based on measured body weight.[10]

Renal impairment:

eGFR calculator

- eGFR ≥50 mL/minute/1.73m^2: normal dose
- eGFR ≥30 to <50mL/minute/1.73m^2: administer 50 mg/kg/dose (to a maximum of 2 grams) every 12 hours
- eGFR ≥10 to <30mL/minute/1.73m^2: administer 50 mg/kg/dose (to a maximum of 2 grams) every 24 hours
- eGFR <10mL/minute/1.73m^2: administer 50 mg/kg/dose (to a maximum of 2 grams) every 48 hours[4, 7]

Hepatic impairment:

- No dosage adjustment required in hepatic impairment.[4, 7]

RECONSTITUTION & ADMINISTRATION

IV injection

- Reconstitute each vial with the volume of water for injection in the table below.[8, 11]
- Reconstituted solutions may darken on storage from light yellow to amber; this does not necessarily indicate a loss of potency.[1]

Vial strength	Volume of water for injection required	Resulting concentration	Displacement volume
1 gram	9.1 mL	100 mg/mL	0.9 mL

- Upon reconstitution carbon dioxide is produced with the solution fizzing and clearing within 1 to 2 minutes. The gas should be vented from the vial after ceftazidime has dissolved.[1, 5]
- Administer the 100 mg/mL solution over 3 to 5 minutes.[1]

IV infusion:

- Further dilute to a final concentration of 40 mg/mL or less and infuse over 15 to 30 minutes.[1]

IM injection:

- Reconstitute each 1 gram vial with 3 mL of lidocaine 1% (10 mg/mL) or water for injection. This results in an approximate final concentration of 260 mg/mL. Shake to dissolve. The solution will fizz and become clear in 1 to 2 minutes.[1, 5, 11]
- **Note: Preparations with lidocaine 1% (10 mg/mL) as diluent must NEVER be given intravenously.**[1, 11]
- The maximum recommended single IM dose is 1 gram. For doses higher than 1 gram, the dose must be split between two sites. Administer up to 1 gram via deep injection into a large muscle mass e.g. vastus lateralis or gluteal muscle.[1, 5, 6]
- Refer to PCH Guideline: Intramuscular Injections (internal link)

COMPATIBILITY *(LIST IS NOT EXHAUSTIVE)*

Compatible fluids:

- Glucose 5%
- Glucose 5% in sodium chloride 0.9%
- Sodium chloride 0.9%[1]

Compatible at Y-site:

Compatibilities of IV drugs must be checked when two or more drugs are given concurrently.

MONITORING

- Renal, hepatic and haematological function should be monitored weekly with prolonged therapy (i.e. longer than 7 days).[2, 4, 7]
- Prothrombin time (PT) should be monitored in at risk patients (e.g. concurrent administration of warfarin, nutritionally deficient, prolonged treatment, hepatic or renal disease).[4, 7]

ADVERSE EFFECTS

Common: diarrhoea, nausea, abdominal pain, vomiting, pain and inflammation at injection site, rash, headache, dizziness, candidiasis, thrombocytosis, thrombophlebitis, eosinophilia.[2, 6]

Infrequent: antibiotic associated colitis, angioedema, anaphylactic reaction.[6]

Rare: neurotoxicity (e.g. confusion, seizures, encephalopathy particularly with high doses and/or renal impairment), blood dyscrasias (e.g. neutropenia, thrombocytopenia), haemolytic anaemia, bleeding, renal impairment, acute kidney injury, tubulointerstitial nephritis, severe cutaneous adverse reactions (SCARs) e.g. Stevens-Johnson Syndrome (SJS), toxic epidermal necrolysis (TEN), drug reaction with eosinophilia and systemic symptoms (DRESS).[2, 6]

STORAGE

- Store vials below 25˚C and protect from light.[1, 5]
- Store syringes prepared by Pharmacy Compounding Service (PCS) between 2˚C and 8˚C.[1, 5]

INTERACTIONS

This medication may interact with other medications; consult PCH approved references (e.g. Clinical Pharmacology), a clinical pharmacist or PCH Medicines Information Service on extension 63546 for more information.

Please note: The information contained in this guideline is to assist with the preparation and administration of **ceftazidime**. Any variations to the doses recommended should be clarified with the prescriber prior to administration

Related CAHS internal policies, procedures and guidelines
Antimicrobial Stewardship Policy
ChAMP Empiric Guidelines and Monographs
KEMH Neonatal Medication Protocols

References

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